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The production and properties of charcoal, peat coke, and other coke substitutes were described in too much detail. Under modern technological and economic conditions, these substitutes cannot compete with coal coke as blast furnace fuels.

The second and third chapters, devoted to the chemical composition and properties of coal, its coking capacity, and the oven charge, are faulty because they uncritically set forth the coal-classification scheme of G. L. Stadnikov, and the theory that bitumen causes coal to cake, which is held by F. Fisher, G. Stadnikov, and others. Since this theory is based on a false premise, it is regrettable that the results of Soviet research in this field did not find proper expression in the book.

Adhering to the natural classification scheme of G. Stadnikov, the authors misinform the reader by saying that "for coking, the last two classes of coal (mixed sapropelite-humic and humic-sapropelite - S.D.) are of the greatest interest, since only these kinds of coal lend themselves to coking under present technical conditions." It is also erroneously stated that "the more oily the compound of sapropelitic origin in mixed coal, the better it will cake."

The research of Soviet scientists Yu. A. Zhemchuzhnikov and his school has proved that coal of mixed origin is not coking coal. Most coal used for coking is humic coal. Soviet research has proved that most sapropelitic coal has only slight caking qualities or does not cake at all. The sapropelitic coal of the Irkutsk basin is an example.

The theory that the bitumen in coal is the caking agent has not been confirmed in practice. There is not a single industrial method of selecting coal for coking which determines selection on the basis of bitumen content.

At present, it is held that there is no connection between the caking capacity of coal and its bitumen content. Caking capacity of coal is determined by its physical and colloidal properties. The authors themselves mention this. In a few pages they present a very brief discussion of the modern viewpoint regarding the caking capacity of coal. On such an important question as this, students are referred to specialized literature.

A government standard since 1941, the plastometric method of L. M. Sapozhnikov is used in research projects and in practice. It cannot be called a perfect method, but by it, the plastometric indexes of coal are very simply determined, and on the basis of the indexes a technological classification has been worked out. Coking practice has shown that coal from one and the same coal basin or coal deposit having about the same plastometric indexes is similar with rare exceptions, a fact which simplifies one of the most responsible coking operations, namely, charging of the oven.

The authors did not understand the classification diagram. We read: "L. Sapozhnikov in his time established optimum limits for the production of good coke" and "the straight line, the so-called line of optimum oven charges, which runs almost in the center of the diagram, is related to the very best of coal and oven charges. This position of L. Sapozhnikov is contradicted in a number of cases by actual practice, particularly in regard to gas and 'hazardous' coal." The classification diagram, based on the plastometric indexes of coal, makes it possible to determine the plastometric nature of coal under strictly standard coal-preparation methods and under actual coking conditions. The use of one and the same kind of coal (or of mixtures of similar kinds) for coking contributes to the quality of the coke.

- 2 -

CONFIDENTIAL

CONFIDENTIAL

50X1-HUM

The modern theory of coke formation, according to which the main mass of coking coal cakes when the coal granules, having been softened in the plastic period, cement together, is not mentioned in the book. Instead, two other theories of the transformation of coal into the plastic state are advanced. According to the first, "the liquefiable part of coal (bitumen) merely soaks the nonliquefiable, and subsequently they cement together." The second theory set forth by the authors is that of G. Stadnikov and holds that coal changes to the liquid state in three stages: liquefaction of the bituminous part, dissolution of the substances difficult of liquefaction in the already liquefied bitumen, and dispersion of the nonliquefiable remainder in the mixture. These theories rest on the erroneous idea that bitumen is the caking agent. The authors incorrectly assume that the theory that coal changes completely into the liquid state has been chemically proved.

The book contains false and contradictory passages, obsolete indexes, and errors.

It is incorrect that "crushing the coal for the oven charge has as its purpose obtaining coke of a required size, usually below 3 - 4 millimeters." Practice has shown that crushing the coal for the oven charge considerably improves the quality of the coke. The percentage of crushed coal up to 3 millimeters in size added to the charge is set by standard.

A manually operated rock-separating machine is not used in mechanical dressing work. Therefore, it should not be mentioned, much less illustrated.

A principle of the Five-Year Plan provides for the dressing of coal, the ash content of which exceeds 7 percent. A statement of the authors that "the ash content of Kuzbass coal is comparatively small -- not over 10 percent -- and, therefore, the coal has up to this time not been subjected to dressing" not only misinforms students, but is false in substance since Kuzbass coking coal is being dressed.

Heating of coke ovens with a mixture of blast-furnace and coke gas passing through gas-distributing canals, or gas conduits, does not take place in actual practice, as the authors recommend.

The practice of coke-chemical plants which heat their coke ovens with blast-furnace gas does not permit simultaneously heating the machine side with blast-furnace gas. It is not feasible to recommend "a pipe line for heating one complete side of a battery with blast-furnace gas."

It is untrue that "most USSR coal contains a little phosphorus," or that "the permissible phosphorus content in coke intended for smelting of high-grade pig iron is limited to 0.1 percent." Coke with such phosphorus content is generally not produced.

Production conditions being the same, increasing the amount of coal in the oven charge while maintaining low discharges of volatile substances decreases the reaction capacity of coke. It is impossible to agree with the authors, who hold that "addition of lean coal to the oven charge increases the reaction capacity of coke."

Contradictory and false indexes are set forth in regard to nitrogen content in coke gas. Nitrogen content in coke gas at coke-chemical plants does not range up to 20 percent, as the book indicates. The coking ovens operate on a system with absolute pressure in the chamber up to the end of the coking process. Therefore, no products from the heating system or air from the atmosphere enter it. Normal nitrogen content in the coke gas of Dinas ovens is usually 3.5 - 4.5 percent. It is impossible to recommend the

- 3 -

CONFIDENTIAL

CONFIDENTIAL

50X1-HUM

statement that new coke furnaces produce gas with an average of 7-percent nitrogen content. A nitrogen content in coke gas of from 1.8 to 2.4 percent is inconsistent with previous indexes, and is basically incorrect. Indexes in regard to consumption of coke gas for heating the coke ovens are obsolete.

It is incomprehensible why the book sets forth the composition of coke gas of foreign plants, and describes consumption of coke gas by Ruhr plants in 1927 - 1936, and in England in 1936 - 1938.

The authors state that the resistance of generators increases "proportionately to the square of the volume of combustion products" instead of "to the square of the volume of air." Other similar errors are found in the book. Water vapor content in coke gas at 50 degrees is incorrectly given as 48 grams per cubic meter.

A textbook ought to have strictly accurate terminology. However, in this respect as well, the book is not altogether reliable. For instance, a "gazosbornik" (gas collector) is called a "baril'yet" (gas-collecting pipe), a "toposhnyy kanal" (heating duct) is called both a "vertikal'" (vertical) and a "otopitel'nyy kanal" (heating duct). The expression "coke-chemical industry" is correct, but not "coke industry." As is known, coke is not now "vyzhigat'" (recasted), and the use of such terminology is confusing in identifying the process. Foreign words, such as "disintegration," "desulfurization," and others clutter up the text and make the material difficult to understand.

The faults brought out by this review should necessarily be considered when it is used for instruction.

- E N D -

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